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ABSTRACT

This document is designed to help individual schools: 1) examine the current mathematics program; 2) select and rank program priorities; 3) compare the current program with the "Guidelines for Programs of Excellence in the Basic Skills" and with successful mathematics programs and practices; 4) state goals and objectives which apply to the individual school; 5) plan appropriate steps to implement a more effective program; 6) formulate plans for Elementary Approval, after mathematics has been identified as a need in a Needs Assessment of Certification Process, or on an Idaho Proficiency Test; and to help districts wishing to improve student performance on the Idaho Proficiency Test by clarifying areas of need in the developmental and remedial mathematics program. This handbook is designed as a self-study unit, programed so that a program task force can follow a step-by-step procedure of collecting data and making decisions. The bulk of the material is designed around ten charts, which are to be used to summarize task force conclusions, share findings, report recommendations, and clarify the planning process. A series of appendices are provided, and are intended to be used as an integral part of the work of the task force. (MP)

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ED213602

MATHEMATICS

PROGRAM ASSESSMENT

AND

PLANNING HANDBOOK

BASIC SKILLS IMPROVEMENT

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STATE OF IDAHO

DEPARTMENT OF EDUCATION

MATHEMATICS PROGRAM ASSESSMENT AND PLANNING HANDBOOK

Fall 1981

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MATHEMATICS PROGRAM ASSESSMENT AND PLANNING HANDBOOK

Fall 1981

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MATHEMATICS PROGRAM

ASSESSMENT and PLANNING HANDBOOK

for use by

AN INDIVIDUAL SCHOOL BUILDING

INTRODUCTION

The Mathematics Program Assessment and Planning Handbook is designed to assist individual schools:

1. To examine the current mathematics program,

2. To select and rank program priorities,

3. To compare the current program with the "Guidelines for Programs of Excellence in the Basic Skills" and with successful mathematics programs and practices,

4. To state goals and objectives which apply to the individual school,

5. To plan appropriate steps to implement a more effective mathematics program,

6. To assist those schools that have identified mathematics as a need in their Needs Assessment process, Certification process, or Idaho Proficiency Test, and guide them in the formulation of plans for Elementary Approval.

7. To help districts wishing to improve student performance on the Idaho Proficiency Test by clarifying areas of need in the developmental and remedial mathematics program.

Curriculum is developed and programs are planned as a result of involving school personnel in deliberations. These deliberations take into account the many variables in a particular situation. They can consider what the program is now and what the school wants the program to be. How to get from where you are to where you want to be is achieved by continuing the planning process.

There are several basic assumptions about program planning:

1. School personnel have at their disposal a significant amount of data on mathematics achievement and attitudes.

2. The only data to be incorporated into the mathematics program assessment should be that which can substantially and realistically aid the school in making necessary decisions.

3. Program assessment, in the sense in which it is used here requires consideration of an array of context variables (teachers, materials, attitudes, non-school resources) in relation to some desired (though not immediately stated) goal. Thus, data are called for which will be used later to determine the objectives of the mathematics program in this school as well as the resources required to reach those objectives.

4. The majority of decisions the school must make will not require information from the diagnostic profiles of individual students. Rather, information concerning group performance in a number of gross sub-areas of mathematics is required. However, actual implementation of a mathematics program does require diagnosis of each individual student's particular mathematics performance.

SUGGESTED PROCEDURES

A (K-12) Task Force should be set up to carry out the mathematics program assessment and planning procedure and to monitor the program. That Task Force should include the principal of the school, a representative from the central administrative office, teachers from elementary and secondary schools*, librarians, parents, and others who seem appropriate.

Larger districts may wish to establish a Task Force for each school in an attendance area for the purpose of gathering data. These Task Forces should then be combined to assess and plan the total program.

The Handbook may be thought of as a self-study unit which is programmed so that a Task Force may follow a step-by-step procedure of collecting data and making decisions. Each member of the Task Force should have a copy of the Handbook and should record the data as they are discussed. The charts are used to summarize committee conclusions, to share findings and report recommendations as well as to clarify the planning process.

The appendix in the Handbook is to be used as an integral part of the work of the Task Force. Included are working papers for use in discussion, suggested forms to assist in the process, definition of terms, bibliography and other helpful information. When a form is to be used with a chart, instructions will be programmed in the directions. There will be frequent references to the appendix. Of particular interest is the "Inservice Needs Summary" which is to be used throughout the planning procedure. Because it specifies personnel deficiencies, the information may be summarized in the form suggested in the Appendix rather than on a chart. Another valuable form is "Determining Procedures for Curriculum Improvement in Our School." This form may be useful where no step-by-step procedure exists or where the procedure needs revising.

*Teacher participation is essential.

The end of the planning activity is signaled by completion of all entries on the charts. Pertinent data may, at this point, be compiled into a written statement which will be available to all participants in the program.

OTHER USES

While the Handbook and charts are designed to apply to program revision in mathematics, they need not be limited to that segment of the curriculum alone. Other school personnel may find the process useful in discussing their curriculum needs.

Administrators may also find the material useful in providing guidance to various working groups or advisory committees. Suggestions for questions to be discussed can be generalized from the charts and the forms in the appendix. In some instances the step-by-step procedure may not be followed, but the kind of questions which need to be raised might be suggested by becoming familiar with what is offered.

Still another use of the material is in college courses in supervision and curriculum development as well as in mathematics instruction. Teachers in preparation can perceive their role as a teacher more clearly as they learn about a curriculum planning process. In any case, the emerging role of the teacher may include significant periods of time devoted to curriculum planning.

Chart 1 -- Directions

BASIC DATA
"Who's On First?"

The purpose of Chart 1 is to describe the population served and to facilitate organization of the Task Force.

Suggested steps to follow:

1. Fill out blanks A through D.

2. Select a permanent chairperson and recorder for the Task Force. The recorder should be given the Meeting Report Form to be completed during this session. (See Appendix A-2)

3. Determine a regular schedule of meetings (1st Wednesday, 4 p.m. etc.) and set the next date, time and place.

4. Assign some member of the Task Force to get the "Additional Data" and record it before the next meeting.

   (In order to derive approximate percent add (1) number of those learning the system or school to (2) number of those new to the system or school, and (3) divide by the total population.)

5. All members will need to scan the entire handbook and read the "Position Paper on Basic Mathematical Skills" (See Appendix A-17) before the next meeting.

6. Discuss and decide to whom the minutes of your meetings will need to be sent. This list may be modified after you have worked through Chart 2D and "Determining Procedures for Curriculum Improvement." (See Appendix A-3)

7. Review your work against the "Check Your Work Form." (See Appendix A-4) As each chart is completed, the committee will be asked to evaluate the work they have done before going on to the next step. Dates will be recorded on Chart 10.

8. Read "Issues and Problems in the Teaching and Learning of Basic Mathematical Skills" (See Appendix A-13). before the next meeting.

9. Adjourn meeting.

Chart 1

BASIC DATA
"Who's On First"

A. NAMES OF SCHOOLS _____

B. GRADES OR LEVELS INCLUDED

C. ENROLLMENT BY GRADE OR LEVEL

B.	K	1	2	3	4	5	6
C.		7	8	9	10	11	12

D. TASK FORCE (names of members): PRINCIPAL _____

MATHEMATICS SPECIALIST _____ LIBRARIAN _____

DISTRICT OFFICE ADMINISTRATOR _____ TEACHERS _____

_____

_____ PARENTS _____

_____ OTHERS _____

ADDITIONAL DATA

E. COMMUNITY REPRESENTED: _____CITY _____SUBURBAN _____RURAL

F. ETHNIC/RACIAL DISTRIBUTION:

_____ % NATIVE AMERICAN _____ % ASIAN _____ % BLACK _____ % MEXICAN AMERICAN

_____ % WHITE _____ % OTHER

G. ON FREE LUNCH _____ % ON REDUCED LUNCH _____ % SINGLE PARENT FAMILIES _____ %

QUALIFIES FOR TITLE I _____(Yes) _____ (No)

H. MOBILITY (LAST THREE YEARS): _____ % STUDENTS _____ % TEACHERS

Chart 2A -- Explanation

MATHEMATICS PROGRAM ASSESSMENT
"Where We Are and What We're Doing"

The purpose of Chart number 2A is to review the components and record the current status of the present mathematics program of the school, and assign priorities for improvement.

Suggestions for sources of data and methods of collecting and recording are provided in the following pages, and in the appendix of this handbook. Data may be recorded as collected on the blank charts in the handbook and may be transferred to the larger charts for display in the faculty lounge. A "Data Collection Form" is included in Appendix A-5.

Central to assessment and planning a mathematics program are, of course, the individual students who are experiencing mathematic difficulties. The importance of their needs must determine the program's emphasis on a diagnostic-prescriptive approach to the teaching of mathematics.

The Task Force must gain a broad view of:

1. Specific areas in which student performance seems most in need of improvement;

2. Patterns of mathematics difficulties within and between grades or levels;

3. Other factors which may affect progress in school, such as an overall climate of expecting success or lack of it.

The 2A chart which follows is for recording data regarding how students perform as well as their interests in, and their attitudes toward mathematics. Specific areas of greatest need will emerge as the data are examined and should become high priority items in planning the new program.

Some of the information requested on Chart 2A may be in the Needs Assessment Project document or the accreditation reports.

Chart 2A -- Directions

Suggested steps to follow:

1. Record on Chart 10, starting date for Chart 2A.
2. Discuss and decide on a plan to collect needed Data regarding Standardized Tests. (You may have none available at this time).
3. On Chart 10, record an estimated completion date for Chart 2A.
4. Record compiled data on the small Chart 2A in the handbook.
5. Answer and record "yes" or "no" to the questions in Section E, Evaluation Strategies, and use the rating scale.

6. Discuss and reach consensus about rating to be assigned to each item. (See Appendix A-7)
7. Read the Appendix A-8 "Assigning Priorities for Objectives."
8. Discuss and reach consensus regarding the priorities and record them in the "Ranked Priori column.
9. Discuss the needs for inservice of the high priority items. List these needs on the "Staff Development Summary Form."
10. Evaluate work on this chart using "Evaluation Procedure, Check Your Work" (See Appendix A-4) and record on Chart 10 the completion date.

Chart 2A

MATHEMATICS PROGRAM ASSESSMENT AND PLANNING

PROGRAM ELEMENTS

I. Student Performance

GRADE OR LEVEL

RANKED PRIORITY

A. Standardized Tests

Record months above or below norm:

1. Achievement
   a. Computation
   b. Concepts
   c. Problem solving
2. Aptitude
   a. Numerical reasoning
   b. Abstract reasoning
   c. Spatial ability
3. Others

B. Criterion Referenced tests

Answer yes or no and rate A, B, C, D, or E (See Appendix A-7)

1. Diagnostic tests are given in mathematics
2. The Idaho Proficiency test is given. (If "yes", attach copy of results)

C. Teacher made or District tests are used to certify achievement in basic math skills.

Answer yes or no and rate A, B, C, D, or E (See Appendix A-7)

D. Informal Measures

1. An attitude toward mathematics survey is given
2. An interest inventory is given

Chart 2A

E. Evaluation Strategies

1. Test results, along with other information are used to determine individual mathematical needs
2. The teacher has formulated or selected specific objectives and performance is measured in terms of these objectives
3. Records of progress are kept for each individual student's performance
4. Students are kept informed of their progress and are involved in self-evaluation (teacher-student conferences)

Answer yes or no and rate A, B, C, D, or E (See Appendix A-7)

Chart 2B -- Directions

The purpose of Chart 2B is to help the Task Force view the organization of the mathematics program and determine what approaches are used for instruction.

Suggested steps to follow:

1. Record on Chart 10 starting date for Chart 2B, and estimated completion date.

2. Discuss and answer "yes" or "no" to questions A through I.

3. Examine for continuity as suggested above.

4. Discuss, reach consensus, and assign priorities (1, 2, 3) to items A through K.

5. Discuss the needs for inservice of the high priority items. List these needs on the "Staff Development Needs Summary Form." (See Appendix A-9)

6. Evaluate and record on Chart 10 the completion date for Chart 2B.

Chart 2B

II. Program Organization

A. Has a scope and sequence been developed by the district?

If yes, does the scope and sequence incorporate these ten basic math skills at appropriate levels?

1. Problem Solving
2. Applications to everyday use
3. Alertness to the reasonableness of result.
4. Estimation and approximation
5. Appropriate computational skills
6. Geometry
7. Measurement
8. Reading, interpreting, and constructing tables, charts and graphs
9. Using mathematics to predict
10. Computer literacy

B. Has the scope and sequence been used to select textbooks and materials?

C. Is mathematics taught indirectly through other subject-matter courses?

D. Is special assistance provided for students in special need of mathematics help?

GRADE OR LEVEL

RANKED PRIORITY

Answer yes or no and rate A, B, C, D, or E

Chart 2B

GRADE OR LEVEL

RANKED PRIORITY

E. Is a variety of courses offered to meet the needs of the students?

F. Is a mathematics specialist available to teach students and/or consult with teachers?

G. Is an aide available to serve as para-professional staff member to assist the teacher of mathematics?

H. In the elementary school, is a sufficient amount of time allowed for instruction in mathematics?

Average number of minutes per week is _____.
Average pupil-teacher ratio is _____.

Record data and rank

I. Which of the following basic approaches and techniques are used for mathematics instruction?

1. Teaching for meaning and understanding
2. Individualized
3. Programmed
4. Peer tutoring
5. Hands-on activities
6. Games
7. Use of calculating services
8. Drill and Practice

Answer yes or no

Chart 2C -- Directions

The purpose of Chart 2C is to examine grouping patterns and determine the status of provision for coordination of the mathematics program K-12 and to identify courses offered on the secondary level.

Suggested steps to follow:

1. Record on Chart 10 starting date for Chart 2C, and estimated completion date.
2. Collect data on grouping patterns from teachers.
3. Record compiled grouping data on Chart 2C in the handbook.
4. Discuss and answer questions "yes" or "no" under Section K.
5. Discuss each item and rate A-E.
6. Discuss, reach consensus, and record the priority (1, 2, 3) given each item.
7. Complete the checklist and Table of Courses (L) if a secondary assessment is being done.
8. Evaluate and record on Chart 10 the completion date for Chart 2C.

Note: If grouping patterns seem to need modification, go to Chart 5 and add "Grouping Patterns" to the Program Component list.

Chart 2C

GRADE OR LEVEL

RANKED PRIORITY

J. What student grouping patterns are used?

1. One-to-one
2. Small groups (5 or less students)
3. Large groups (5 or more students)
4. Total class
5. Heterogeneous
6. Homogeneous
7. Is there need to study group patterns?
   Yes____ No____ Priority?

K. What other features of a coordinated math program are evident?

Answer yes or not and rate A, B, C, D, or E.

1. Is a single planned, systematic program for teaching math skills used for most students in the school?
2. Is there an alternative program provided for individual children who need it?
3. Does the teacher use the text manual and supportive materials?
4. Is a written record of skills mastered by each student available?
5. Is provision made in the school for careful math placement of entering student with no records?
6. When will money be allocated for major change of mathematics materials? (date)_____

Chart 2C

L. Complete the following checklist and table of courses in mathematics. (Secondary level only)

Checklist

		Yes	No	Priority
1.	A minimum of one year of study in mathematics is required.			
2.	Courses in mathematics are provided for all students.			
3.	Courses are available throughout the secondary school program to suit the student's ability and to meet academic and vocational needs.			
4.	Provision is made to prepare students to enter college with advanced standing in mathematics.			
5.	Provision is made for the transfer of students from one ability grouping to another.			
6.	The mathematics curriculum emphasizes general principles, ideas, and techniques that have wide application and educational value.			
7.	Provision is made for students to pursue independent study.			
8.	Individual instruction or special classes are available to the gifted student.			
9.	Teachers from the various grade levels plan together to develop a sequential program in mathematics.			
10.	Teachers of the same grade level work together to develop the mathematics program at that level.			

Chart 2D -- Directions

The purpose of Chart 2D is to help the Task Force look at the resources, both material and human, available in the building to teach mathematics and to ascertain the district decision makers and the process regarding curriculum changes.

Ultimately, however, any differences that occur in instruction will be in the classroom and for this reason assessment of teacher and paraprofessional skills is most important.

Suggested steps to follow:

1. Record on Chart 10 starting date for Chart 2D, and estimated completion date.
2. Discuss and plan an appropriate way for your building to complete the "Survey of Training in Mathematics Form".
3. Discuss, reach consensus, and record "yes" or "no" on the questions regarding textbooks and supplemental instruction materials.
4. Assign a Task Force member to determine and record the number of hours available to the school by mathematics specialists, outside consultants and volunteers.
5. Determine if there is a specific procedure in your district for improving curriculum.
6. If a procedure exists, complete the "Determining Procedures for Curriculum Improvement in Our School." (Appendix A-3)
7. Optional: If no procedure exists, complete any questions that you can on the above-mentioned form paying particular attention to IV.
8. Discuss, reach consensus and assign priorities to the appropriate items.
9. Evaluate and record completion of Chart D on Chart 10.

Chart 2D

III. RESOURCES

	YES	NO	PRIORITY
A. Skills Assessment of Classroom teachers of mathematics.			
Has the "Survey of Training in Mathematics" form been completed for each member of the certified staff?			
B. Textbooks			
Are adequate and appropriate mathematics textbooks available for each level of student performance?			
C. Supplemental Instructional Materials:			
Are adequate and appropriate supplementary books and materials available for each level of student performance?			
D. Staff Mathematics Specialists			
Number available to school _____			
Hours available per week _____			
E. Outside Consultants			
Hours available per week _____			
F. Volunteers			
Hours available per week _____			

Chart 3 -- Directions

The purpose of Chart 3 is to provide a display of the selected goals arranged in three categories as determined by the Task Force.

Suggested steps to follow:

1. Review Charts 2A, 2B, 2C and 2D. Enter all items from these charts that are ranked "1" in the Category 1, Critical of Chart 3. Items ranked "2" should be entered in the Category 2, Important column, etc.

2. All items that have been entered in the Category 1, Critical column represent the first series of goals to be accomplished by the Task Force. The other categories will be reserved for action by the Task Force as the critical goals are completed.

Note: As additional charts are completed and more data gathered, other high priority needs may become evident. If so, add them to this chart.

22.

Chart 3

SUMMARY OF PRIORITIES (GOALS)
"In a Nutshell"

CATEGORY 1 Critical	CATEGORY 2 Important	CATEGORY 3 Desirable

Chart 4 -- Directions

GUIDELINES FOR PROGRAM OF EXCELLENCE IN BASIC SKILLS (Chart 4 is Optional)
"We Want the Best"

The purpose of Chart 4 is to create awareness among the instructional staff of the "Guidelines for Programs of Excellence in the Basic Skills" and to allow them to compare the mathematics program with the Guidelines.

Note: Steps 2 and 3 may be carried out in a staff meeting because all staff are involved, not the Task Force only.

1. Before the staff meeting at which this assessment will be discussed, duplicate Chart 4 for each staff member.
2. Read and discuss each of the items of the Guideline.
3. Distribute the duplicated charts asking staff members to mark "yes" or "no" according to how they see each guideline being accomplished with appropriate comments. The staff should also fill in columns 3 and 4. The marking of the chart may be done in private, in conference with the principal, or in group situations and may be signed or unsigned.
4. Compile the information and record on the chart.
5. Examine, discuss and note the inservice needs on "Staff Development Needs Summary." (See Appendix A-9.)
6. (Optional) At this point, the entire staff may wish to develop a building philosophy statement regarding the teaching of mathematics.
7. Evaluate work on this chart and record appropriate information on Chart 10.

Chart 4 GUIDELINES FOR PROGRAMS OF EXCELLENCE IN BASIC SKILLS (Duplicate as needed)

GUIDELINES	1 Is this being accomplished now? Yes	1 Is this being accomplished now? No	2 If Yes: How do you know? If No: Why?	3 Do we want to see this accomplished? Yes	3 Do we want to see this accomplished? No	4 If No: Why not?
I. COMMUNITY AND SCHOOL The community views basic skills both in school and out-of-school, as fundamental to the total educational system, and as a measure of that commitment contributes to and supports basic skills activities at all levels.						
1. The school and community atmosphere reflects commitment to the importance and enjoyment of basic skills.						
2. The school is open to the participation of members representative of the community, students, parents and staff in advising on policies concerning basic skills activities.						
3. The total community including public and school libraries is used as a resource in the basic skills effort.						
4. The school introduces, explains, and periodically presents the basic skills program including effective teaching methods and materials to the community.						

GUIDELINES	1 Is this being accomplished now? Yes	1 Is this being accomplished now? No	2 If Yes: How do you know? If No: Why?	3 Do we want to see this accomplished? Yes	3 Do we want to see this accomplished? No	4 If No: Why not?
5. The district is willing to share trained personnel, teaching methods and materials which have proved effective in basic skills programs.						
6 Each school maintains a reporting system that fully and accurately communicates student progress to parents.						
7. The board of trustees provides adequate financial support for basic skills activities.						
8. The board of trustees and administration encourages and supports teacher participation in professional subject area organizations.						
Mathematics						
9. The community is aware of the uses of the computer and calculator as teaching tools.						

GUIDELINES	1 Is this being accomplished now? Yes	1 Is this being accomplished now? No	2 If Yes: How do you know? If No: Why?	3 Do we want to see this accomplished? Yes	3 Do we want to see this accomplished? No	4 If No: Why not?
II. SCHOOL ORGANIZATION AND ADMINISTRATION						
The school provides an organized and consistent approach to instruction in the basic skills.						
Program						
1. The district has a K-12 curriculum in each of the basic skill areas.						
2. Teachers understand the relationship of their level to the entire curriculum.						
3. The classroom climate reflects respect for and support of each student's progress.						
4. The school has a scope and sequence of basic skills that can be used for record keeping, communication and planning.						
5. Programs are available throughout the curriculum to suit students' abilities and to meet their academic and vocational needs.						

GUIDELINES	1 Is this being accomplished now? Yes	No	2 If Yes: How do you know? If No: Why?	3 Do we want to see this accomplished? Yes	No	4 If No: Why not?
6. Coordination and cooperation exists internally in the basic curriculum and with other programs including local, state, and federally funded supplementary programs.						
7. Student/teacher ratios are adjusted as necessary to meet the objectives of the basic skills program.						
8. A continuous record keeping system including samples of student work is maintained and used.						
9. Transfer students are placed according to each student's diagnosed needs and abilities.						
10. The staff works cooperatively with existing preschool programs, such as Head Start or public and school library activities to promote general learning readiness.						

GUIDELINES	1 Is this being accomplished now? Yes	1 Is this being accomplished now? No	2 If Yes: How do you know? If No: Why?	3 Do we want to see this accomplished? Yes	3 Do we want to see this accomplished? No	4 If No: Why not?
11. The administration encourages and cooperates with adult in-community education activities.						
12. Bilingual instruction or English as a second language is provided as determined by the needs of the individual student.						
13. The staff encourages summer programs for enrichment and remedial instruction.						
14. Students in the district have easy access to a library media center with a wide variety of materials.						
15. There is evidence of regular communication and coordination activities among elementary and secondary schools throughout the district about individual student's progress and basic skills curricula.						

GUIDELINES	1 Is this being accomplished now? Yes	1 Is this being accomplished now? No	2 If Yes: How do you know? If No: Why?	3 Do we want to see this accomplished? Yes	3 Do we want to see this accomplished? No	4 If No: Why not?
16. Opportunity is provided for both advanced and remedial instruction as well as special education to meet the needs of handicapped students.						
Staff						
1. The building administrator provides the leadership and resources to foster the development of an excellent basic skills program.						
2. Each teacher with the major responsibility for teaching a basic skill meets the state certification requirements and strives to meet the qualifications recommended by the appropriate professional subject area association.						
3. Teachers at all levels and subject areas cooperate to help students in basic skills areas.						

GUIDELINES	1 Is this being accomplished now: Yes	No	2 If Yes: How do you know? If No: Why?	3 Do we want to see this accomplished? Yes	No	4 If No: Why not?
4. All teachers accept responsibility for maintaining their teaching competence and are aware of current research and trends.						
5. A qualified person has the authority, responsibility, and time granted by the administration and board of trustees to organize, implement and coordinate a comprehensive program in each of the basic skills.						
6. Trained aides and volunteer helpers in basic skills instruction work with students under direct supervision of the classroom teacher.						
7. Teachers and administrators jointly plan continuous staff development in basic skills for teachers, administrators, and support personnel.						
8. Each teacher knows the scope and sequence used in the school to promote learning the basic skills.						

GUIDELINES	1 Is this being accomplished now? Yes	1 Is this being accomplished now? No	2 If Yes: How do you know? If No: Why?	3 Do we want to see this accomplished? Yes	3 Do we want to see this accomplished? No	4 If No: Why not?
III. INSTRUCTION						
The staff is committed to student competence in the basic skills as a major goal of instruction.						
1. Sufficient class time is allowed for the learning tasks related to reading, writing, oral language, and mathematics.						
2. Sufficient class time is allowed for uninterrupted reading and writing.						
3. Opportunities are provided for extending students' background of experiences as necessary to the total basic skills program.						
4. Instructional activities account for student achievement levels, learning styles and current interests.						
5. Teachers use a variety of methods and materials based on clearly formulated objectives to meet curriculum goals.						

GUIDELINES	1 Is this being accomplished now? Yes	1 Is this being accomplished now? No	2 If Yes: How do you know? If No: Why?	3 Do we want to see this accomplished? Yes	3 Do we want to see this accomplished? No	4 If no: Why not?
6. Teachers at all levels use methods of teaching that emphasize understanding and application as well as skill development.						
7. Teachers obtain diagnosis of and assistance for students with special needs by using a referral system.						
8. Students are informed of progress and are encouraged to participate in planning personal goals and objectives.						

GUIDELINES	1 Is this being accomplished now? Yes	1 Is this being accomplished now? No	2 If Yes: How do you know? If No: Why?	3 Do we want to see this accomplished? Yes	3 Do we want to see this accomplished? No	4 If No: Why not?
IV. FACILITIES AND MATERIALS						
Materials selected according to locally developed criteria for continuous and consistent basic skills programs are provided and utilized.						
1. Appropriate supplementary books and other materials to support basic skills curricula are provided and used.						
2. Instructional and practice materials as well as production equipment are available in each school and are used by all teachers.						
3. A wide variety of print and non-print materials appropriate to all levels of learning is available and readily accessible and utilized.						
4. Materials that recognize and meet the needs of different races, cultures, sexes, ages, physical or mental capabilities are used.						

GUIDELINES	1 Is this being accomplished now? Yes	1 Is this being accomplished now? No	2 If Yes: How do you know? If No: Why?	3 Do we want to see this accomplished? Yes	3 Do we want to see this accomplished? No	4 If No: Why not?
5. The objectives of the basic skills curriculum are considered in the selection of print and nonprint materials and textbooks.						
6. All subject area teachers give consideration to the appropriateness of the readability, general format, vocabulary treatment and author's style in the selection of materials.						
7. Professional materials including current journals and publications are available for each teacher's use.						
8. Elementary and secondary school library media centers satisfy the criteria set out by the Idaho Board of Education and strive to meet the standards of the American Library Association.						

GUIDELINES	1 Is this being accomplished now? Yes	1 Is this being accomplished now? No	2 If Yes: How do you know? If No: Why?	3 Do we want to see this accomplished? Yes	3 Do we want to see this accomplished? No	4 If No: Why not?
9. The materials in the library media center are selected on the basis of a written policy.						
10. The materials selected reflect a commitment to the library's responsibility to provide reseaand reference opportunities as well as those for pleasure.						
11. The school's facilities are adaptable and are used to promote maximum learning.						
12. Display areas for student work in basic skills programs are provided and used in individual classrooms and throughout the school.						

GUIDELINES	1 Is this being accomplished now? Yes	1 Is this being accomplished now? No	2 If Yes: How do you know? If No: Why?	3 Do we want to see this accomplished? Yes	3 Do we want to see this accomplished? No	4 If No: Why not?
V. EVALUATION						
Evaluation of the basic skills program is critical in determining student progress and ascertaining program areas in need of improvement.						
1. A plan for evaluating student skills that includes a written rationale for evaluation has been adopted and implemented.						
2. The district's program is reviewed and evaluated regularly to determine critical needs and priorities.						
3. Goals and objectives are formulated to reflect the findings of formative evaluations of the program.						

Chart 5 -- Directions

REVIEW OF EFFECTIVE PROGRAMS
"Is The Grass Greener?"

The purpose of Chart 5 is to review programs and literature of exemplary practices of teaching math in accordance with criteria selected by the Task Force to aid in the development of program objectives.

The completion of this chart may take considerable time because locating, writing for information, studying, and/or arranging for visits to other programs is not a short-term process but its importance should not be overlooked. To omit this step could result in many wasted hours. Why attempt to rely on your own resources to reach your goals when other districts may have faced and solved some of the same problems?

The Idaho State Department of Education, district offices, colleges, publishers, district basic skills coordinators, state libraries, as well as local staff and community people may have information regarding programs to visit and research. Professional journals often carry articles describing ways to meet district needs that could spark creative ideas among the Task Force members.

Visitations, however, can be meaningless. To avoid this problem all Task Force members should have clearly in mind their specific objectives. That is the purpose of checking components prior to a visitation. Members also need to use an organized system to note and bring back pertinent information to the entire Task Force so all may help decide if the "Grass is Greener."

Suggested steps to follow for this chart:

1. Discuss the program components listed at the top of the chart.
2. Check ✓ those that are important to your district in light of any deficiencies that you may have found in using Charts 2A, B, C, D.
3. List and check ✓ other components that may be apparent after the study of the Guidelines.
4. List in the blank spaces and check ✓ other components that are unique to your district needs.
5. List in the left column programs to visit and/or study and check components each includes.
6. Decide who will be responsible for arranging each visitation, conducting a study of those too far away to visit, and compiling the information gathered.
7. Develop a system which will aid each member of the Task Force to become fully aware of the contribution of every visitation and study to your overall plans for improving math in your district.
8. Compare, select, and mark good examples of program components that may be included in your proposed program.
9. Evaluate and record completion of this chart on Chart 10.

Chart 5

REVIEW OF EFFECTIVE PROGRAMS
"Is the Grass Greener?"

Select and check ✓ program components that are important to your district.

Program Component	Class Organization and schedule	Diagnosis Prescription Methods	Instructional Approach	Student Motivation	Parent/Community Involvement	Personnel Requirements	Staff Development	First Language Instruction	Materials	Materials Keyed to Skills	Instructional Equipment	Management System	Recordkeeping	Facilities	Evaluation	Start-up Cost	Per Pupil Operating Cost	Coordination Activities
Effective Program Locations																		

Chart 6 -- Directions

The purpose of Chart 6 is to develop behavioral objectives in relation to goals established by the Task Force. Competency in writing behavioral objectives is needed for Chart 6 and if lacking, inservice or the study of appropriate materials is indicated. Although the completion of Chart 6 may not be easy, it holds potential for tremendous rewards.

The "Goal" statements should indicate the outcomes expected by the Task Force in light of any deficiencies shown on Charts 2A, B, C, D. They are generally expressed in general (non-measurable) terms. Example: To improve the computational skills of students in the primary grades. For each goal there may be several (number will vary) steps necessary.

These steps are the statements that need to be expressed in behavioral terms. Example: When given a measurable physical property such as length, area, weight, temperature, etc., the student can select a suitable unit and measure the property with 100% accuracy. A behavioral objective has these aspects: (1) description of the expected level of performance (written with 100% accuracy) and (2) the conditions under which the expectancy should be reached (when given a measurable property). These behavioral objectives are critical to the development of the program because they establish an objective basis for measuring program effectiveness and for guiding program change, whenever that becomes necessary. Behaviors should also refer to performances that call upon the same instructional materials being used in the school's program. They must also reflect the unique needs of the district as well as the local resources.

After the behavioral statements are completed, they can be linked to particular instructional materials as the prescriptive phases of a Diagnostic -- Prescriptive -- Evaluative system. There may be need for the continuous development of new objectives as the program evolves and improves.

Suggested steps to follow:

1. Assess the abilities of the Task Force members to write behavioral objectives using Evaluation Exercise: Recognizing Well-Defined Objectives.
2. If help is needed, arrange for inservice.
3. Convert each critical category statement from Chart 3 to a goal statement and enter in one of the larger areas at the left of the chart.
4. Write, in behavioral terms, the steps needed to accomplish each of the goal statements.
5. Evaluate the work on this chart and record the appropriate information on Chart 10.

Chart 6

GOALS AND OBJECTIVES
"Sighting In"

*Additional copies of this chart may be needed.

GOALS (CRITICAL PRIORITIES)	BEHAVIORAL OBJECTIVES (SOLUTION STRATEGIES)

Chart 7A -- Directions

The purpose of Chart 7A is to record plans for diagnosis, prescription, and evaluation of selected objectives in learning activities. Using the learner-objectives (not curricular) from Chart 3 and the information obtained on Charts 2A, 2B, 2C, and 2D, the Task Force should be able to determine a method of measuring growth for each objective. It is important to realize that both teacher and commercially prepared instruments have value in the process. The instruments selected must measure the objective under consideration. For instance, to meet a skill goal such as "improving number recognition in the primary grades," the Task Force might develop as one objective: "Given a list of numbers, the student will accurately and instantly identify each number as it is presented to him or her." This is the diagnostic phase of teaching and should reveal which numbers the student knows and which s/he must learn. The prescriptive phase comes next, in which certain activities should prepare the student to reach the objective. The activities may vary, but whatever is done should be specific for that objective. The evaluation stage comes when the student has completed the activities and is again asked to recognize the numbers at sight. If s/he can do so, the objective has been reached, if not, reteaching is indicated.

Instruments that measure specific objectives come in many forms: standardized tests, criterion measurement, attitude surveys and interest inventories. Be sure that the diagnostic instrument measures the current state of knowledge of the objective, the instructional materials fit the students' needs and if the initial instruction does not accomplish the objective, provision is made to redirect efforts using alternative materials.

Suggested steps to follow:

1. List the learner objectives in behavioral terms taken from Chart 6.

2. Determine the test or other evaluation technique to be used to measure current knowledge of the selected student population for the objective.

3. After discussion and study of possible instruments, list the person responsible for acquiring or developing the test/technique for use and record by what date it will be needed. (Pre-test)

4. Determine what materials will be needed to teach to the objective. List the materials needed, the person responsible for obtaining them, and by what date they should be available for use.

5. Determine the technique for evaluating the instructional activity. (Post-test)

6. After discussion and study of possible evaluative materials, list the person who will be responsible for acquiring or developing the test/technique and record by what date it will be needed.

7. From the information in former steps, determine a pre- and post-test schedule. At this stage of your planning remember that revision of the time span may be altered in the future.

8. Discuss and decide if inservice will be needed in order for the staff to use the tests and other evaluative techniques indicated on this chart. If so, record on the "Staff Development Need" form. (See Appendix A-9)

9. Evaluate your work on this chart and record completion date.

Chart 7A

ACTION DESIGN
"Who, What and By When"

	DIAGNOSIS		PRESCRIPTION		EVALUATION			
LEARNER OBJECTIVE	Test or Other Evaluation Technique Available	Test/Technique Acquired or Developed By Whom	Materials Available	Materials Needed, Acquired or Developed By Whom	Test/ Technique Available	Test/Technique Acquired or Developed By Whom	Estimated Evaluation Schedule Pre	Post

Chart 8 -- Directions

COST ANALYSIS FOR PROPOSED PROGRAM
"Do We Have The Green Stuff"

The purpose of this chart is to focus consideration on additional personnel and materials which may be needed to carry out the objectives determined for this program. By completing this chart, you will be able to estimate the personnel and other costs for each objective selected. Attention is directed to two areas: (1) instructional personnel needed to implement action for achieving each objective and (2) costs of additional staff time, materials, and supplies necessary for inservice and curriculum planning.

Do you have sufficient number of staff members to do the job? For each objective, you will need to answer this question for both certificated and non-certificated staff. Will you need additional work days for staff inservice and curriculum planning? How many days total? Your personnel office should be able to help you estimate these costs. Do you have the professional books you need and other materials for staff development? Will you need consultative services? If you will, make an estimate of what you will need and the cost.

Your totals will help you determine whether each objective is realistic at the present time as you consider its cost in relation to resources available. The completed chart may be helpful to you in justifying requests for additional allocations for your math program.

This chart shows what additional dollars will buy. Suggested steps to follow:

1. List your objectives from Chart 6.
2. Discuss, decide and answer "yes" or "no" regarding the adequacy of your entire staff to carry out the first objective (Column A).
3. If your answer is "yes," proceed to Column F. Discuss and decide if additional work days will be needed for inservice and/or curriculum planning. Answer "yes" or "no." If the answer is "no" record and go on to your next objective.
4. If the answer to Column A is "no," discuss decide and record in Columns B and D the number of certificated and/or non-certificated personnel needed. Estimate the cost and record in Column C and/or E.
5. Proceed to Column F. If the answer is "yes," decide and record in Columns G and I the estimate of additional days needed for inservice and/or curriculum planning. Estimate costs and record in Column H and/or J.
6. Refer to Staff Development Needs Form. (Appendix A-9).
7. Estimate cost of professional materials, supplies, consultative services, workshops, etc., and record in Column K.
8. Column L = C + E + H + J and K. Record estimate of total additional costs for this objective.
9. Proceed to your next objective, if any.
10. Total all columns at bottom of the chart. Add Columns C, E, H, J and K for total cost of proposed program.
11. Consider the cost in relationship to resources available. You may need to refer to "Determining Procedures for Curriculum Improvement in Our School." (Appendix A-3)

Chart 8

COST ANALYSIS FOR PROPOSED PROGRAM
"Do We Have the Green Stuff"

	A		B	C	D	E	F		G	H
Our Objectives	Is staff number adequate? Yes	No	If no, additional certificated personnel needed	Estimated annual cost	If no, additional classified personnel	Estimated annual cost	Are additional work days necessary for inservice and/or curriculum work Yes	No	If yes, additional certificated days necessary	Estimated cost
TOTALS										

I	J	K	L
If yes, additional classified days needed	Estimated cost	Professional materials and supplies for inservice and planning	Estimate of total additional cost

OCT 85

Chart 9 -- Directions

INSTRUCTIONAL MATERIALS, EQUIPMENT AND SERVICES
"Beg, Borrow or Steal"

The purpose of Chart 9 is to provide means of listing materials, equipment and services currently available and of determining costs of additional instructional materials and services needed to implement the stated objectives. An inventory of the building's materials must be available to complete this chart.

Suggested steps to follow:

1. Study the building inventory.
2. Check ⓥ items necessary to proposed program.
3. Record each checked ⓥ item for Columns A, B and C if quantity known.
4. Decide who will be responsible to determine and record the number for Column C (number available from other sources.)
5. Decide who will be responsible to determine cost per individual item.
6. Decide who will be responsible for calculating and recording costs. (Column E)
7. Evaluate and record the completion of this chart and on Chart 10.

Chart 9

INSTRUCTIONAL MATERIALS, EQUIPMENT AND SERVICES
"Beg, Borrow or Steal"

ITEMS (Check ✓ only those necessary to proposed program)		A Number needed for program	B Number available in school	C Number available from other sources	D Number to be purchased	E Estimated cost if purchased
Basal texts	○					
Programmed texts	○					
Workbooks	○					
Worksheets	○					
Tests	○					
Multi Media kits	○					
Games/Simulations	○					
Library Materials	○					
Films, Filmstrips	○					
Instructional Equipment	○					
Parent/Community Expenses	○					
Field Trips	○					
Other	○					

Chart 10 -- Directions

MONITORING OUR PROGRESS
"Time Marches On"

The purpose of Chart 10 is to record planned and current programs in the completion of the charts. A continuous evaluation process is necessary to make this system work. Chart 10 is used to record progress, but the actual evaluation procedure is carried out using the "Check Your Work" form. (Appendix A-4) This procedure is followed as each chart is completed before proceeding.

Suggested steps for Chart 10:

1. At the first Task Force session record the "Beginning Date" and "Proposed Completion Date" for Chart 1.

2. After Chart 1 is finished, and before recording the "Completion Date," the entire chart should be evaluated using the criteria on the "Check Your Work" form. (Appendix A-4)

3. Proceed to next chart and repeat Steps 1 and 2 for 2A, 2B, 2C through 9.

Chart 10

MONITORING OUR PROGRESS
"Time Marches On"

CHART	BEGINNING DATE	PROPOSED COMPLETION DATE	COMPLETION DATE	NOTE
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Chairperson of Task Force

APPENDIX A

APPENDICES

A-1 Purpose of the Charts 1-10
A-2 Mathematics Task Force Meeting Report Form
A-3 Determining Procedures for Curriculum Improvement in Our Schools
A-4 Evaluation Procedure
A-5 Data Collection
A-6 Standardized Tests
A-7 Rating Scale Information
A-8 Assigning Priorities for Objectives
A-9 Staff Development Needs Summary
A-11 Survey of Training in Mathematics
A-12 Report of the Kansas City Coordinating Conference (KC3)
A-17 Position Paper on Basic Mathematics Skills

PURPOSES OF THE CHARTS 1 -- 10

1. The purpose of chart number 1 is to describe the population served and to facilitate the organization of the Task Force.

2. The purpose of chart number 2 is to review the components and record the current status of the math program. Further, to assign priorities for improvement of the school's math program.

3. The purpose of chart number 3 is to provide a display of the selected goals arranged in 3 categories as determined by the Task Force.

4. The purpose of chart number 4 is to record self-assessment by the instructional staff of readiness to carry out the program components.

5. The purpose of chart number 5 is to develop behavioral objectives in relation to goals established by the Task Force.

6. The purpose of chart number 6 is to review programs and literature of exemplary practices of teaching math in accordance with criteria selected by the Task Force to aid in the development of program objectives.

7. The purpose of chart number 7 is to record plans for diagnosis, prescription, and evaluation of selected objectives in learning and curriculum, and to determine instructional approaches, methods, and techniques.

8. The purpose of chart 8 is to record plans for staff development needs to implement the stated objectives.

9. The purpose of chart number 9 is to provide means of listing materials, equipment and services currently available and of determining costs of additional instructional materials and services, and personnel needed to implement the stated objectives.

10. The purpose of chart 10 is to record the continuous evaluation of the program.

For Use With All Charts
(Duplicate as needed)

MATHEMATICS TASK FORCE MEETING REPORT FORM

Date_____

Check -- if present

MEMBERS' NAMES

Chairperson
Recorder _____ ____ _____ ____
_____ ____ _____ ____
_____ ____ _____ ____
_____ ____ _____ ____
_____ ____ _____ ____

OTHERS: _____

The Task Force Worked on Chart _____. Discussion topics, activities and decisions were:

1.

2.

3.

If more space is needed, please use the back of this sheet.

At our next meeting (Date _____ Time _____ Place _____) we will consider Chart_____.

Our assignments before the next meeting are:

_____

_____

Signed _____
Recorder

Recorder Note: Please complete this form at the meeting and give to school secretary (or other person) to type and distribute to the following people:

A-2

DETERMINING PROCEDURES FOR CURRICULUM IMPROVEMENT IN OUR SCHOOL

I. Who has control over curriculum change in our school:

	YES	NO
Must the Department of Education approve changes in our supplementary mathematics program?	___	___
Must the State Department of Education approve?	___	___
Must the county or intermediate district approve?	___	___
Must our school board approve?	___	___
Must our superintendent approve?	___	___
Must an administrator of instruction approve?	___	___
Must a district instruction committee approve?	___	___
Must the teachers' bargaining unit approve?	___	___
Must the parent organization approve?	___	___
Must the principals' group approve?	___	___
Must a math specialist approve?	___	___
Must the building principal approve?	___	___
Must each teacher approve?	___	___
Other _____?	___	___

II. Write out the step-by-step procedures used for changing curriculum in this school district.

III. Are modifications needed in the school's curriculum improvement processes and procedures in order to bring about a more effective math program? (Yes or No)

IV. If modifications are needed, what proposal will you make? To Whom? When?

EVALUATION PROCEDURE
"Check Your Work"

As each chart is completed, the Task Force should examine the results, using the following procedure:

A. Review the product

1. Have all of the steps required for the completion of the chart been considered and provided for?

2. Are the results accurate?

3. Is there concensus that the Task Force is now ready to proceed to the next chart?

B. Recycle when needed

1. If the Task Force is not satisfied with the quality of the work performed the tasks should be repeated until a concensus of satisfaction is reached.

2. When concensus is reached, the chart is completed and the Task Force proceeds to "C."

C. Provide appropriate progress reports

1. Accurate records of decisions and action should be maintained.

2. A variety of reports may be essential. The district administrator may need a constant flow of information, given directly by the chairperson while the district faculty may receive written periodic progress reports.

D. Secure authority to proceed

1. Even though initial authority should have been granted to the Task Force to improve the math program, it may be essential to reaffirm this authority at some steps of the process.

2. Accurate documentation is regarded as essential to the granting of authority especially for those steps requiring additional funding.

3. If authority is withheld:

(a) Seek clarification for the withholding and plan appropriate alternatives to overcome the deficiencies.

(b) Suspend the Task Force temporarily.

4. Proceed to the next step (chart) when all of the above evaluative steps have been accomplished.

5. Record completion progress on chart Number 10.

DATA COLLECTION

Grade Level _____ Date of Test _____ Evaluation Instrument Used _____

Number of Students _____

OPTIONAL

SUBJECT OR AREA	More than 2 years below	1-2 years below	1/2 to 1 year below	1/2 year above to 1/2 year below	1/2 to 1 year above	1-2 years above	More than 2 years above	Class Range	Class Average	Norm	Diff. between Class Average and Norm (in months)
COMPUTATION											
CONCEPTS											
PROBLEM SOLVING											
NUMERICAL REASONING											
ABSTRACT REASONING											
SPATIAL ABILITY											

Transfer data from the last column to the 2A Chart.

A-5

Chart 2A

STANDARDIZED TESTS

In collecting data on student performance, the following examples and explanations may prove helpful. The blank forms should be filled, ready for data transfer to Chart 2A, when appropriate information has been gathered. Information on math computation, concepts, problem solving, and other achievement data may be gathered from currently existing student files. Where current data are not available on a given group of students, data gathered during the previous school year may be substituted. However, data should be no more than one year old.

DATA COLLEC ION

Grade or Level Grade 4

Subject or Area	Evaluation Instrument Used	Date	Class Range	Class Average	Norm**	Diff. between Class Average and Norm (In Months)
Math	California Achievement Math 1970 Form A	Feb. 4	2.1	3.9	4.5	-6

**The norm is unique to the test used. It should be stated for each evaluative instrument used.

For each grade or level the difference between the class average and the test norm (in Months) should be transferred to Chart 2, see Appendix A-5 for "Data Collection" form.

Data may be displayed using other formats also. The following is used to focus on achievement patterns within a class. (These data are not transferable to Chart 2.)

RATING SCALE INFORMATION

With the exception of the Standardized Test Results, ratings may be recorded in a number of sections of Chart 2. These evaluative ratings should reflect the combined judgements of the members of the Unit Task Force, using the following rating scale:

A -- completely satisfactory

B -- some improvements needed

C -- major improvements needed

D -- completely unsatisfactory

E -- inappropriate for grade/level

ASSIGNING PRIORITIES FOR OBJECTIVES

As each chart is completed the Task Force should examine the data as a basis for assigning a priority rating of 1, 2, or 3 in accordance with this scale:

Priority 1 -- missing component or unacceptable condition that must be changed at the outset of the program.

Priority 2 -- weak component, needs strengthening during the coming year.

Priority 3 -- adequate component or non-critical situation to be corrected over period greater than one year.

Decisions on priorities and their recording should be made only after consensus has been reached by all members of the Task Force. These priorities will be entered in the appropriate column, and will be used as a basis for setting up objectives for the proposed math program.

STAFF DEVELOPMENT NEEDS SUMMARY

What inservice is needed to overcome deficiencies indicated on the Charts?

Chart 2A --

What specific kind of inservice? _____
_____
_____

For what personnel?
Principal _____
Teachers, Grade/Level _____
Title I and Paraprofessionals,
Grade/Level _____
Volunteers _____

Chart 2B --

What specific kind of inservice? _____
_____
_____

For what personnel?
Principal _____
Teachers, Grade/Level _____
Paraprofessionals, Grade/Level _____
Volunteers _____

If a change in the organization of the mathematics program is planned, what plans for inservice are needed and provided for? _____
_____
_____

Who will provide inservice? _____
_____

How much time do you think will be needed? _____

Chart 2C --

What specific kind of inservice? _____
_____
_____

For what personnel?
Principal _____
Teachers, Grade/Level _____
Paraprofessionals, Grade/Level _____
Volunteers _____

Chart 2D --

What specific kind of inservice? _____

_____

For what personnel?
Principal _____
Teachers, Grade/Level _____
Paraprofessionals, Grade/Level _____
Volunteers _____

Chart 4 --

What specific items need inservice?
Item numbers _____

For what personnel?
Principal _____
Teachers, Grade/Level _____
Paraprofessionals, Grade/Level _____
Volunteers _____

Chart 7A --

Will staff inservice be needed to use the instruments and/or other evaluative techniques recommended on this chart?

What specific kind of inservice? _____

_____

For what personnel?
Principal _____
Teachers, Grade/Level _____
Paraprofessionals, Grade/Level _____
Volunteers _____

Chart 7B --

What specific kind of inservice? _____

_____

For what personnel?
Principal _____
Teachers, Grade/Level _____
Paraprofessionals, Grade/Level _____
Volunteers _____

Note: As inservice needs are identified, give the information to your district's Inservice Director or Inservice Contact Person.

Survey of Training in Mathematics

Please check the appropriate item.

Do you teach mathematics? ____Yes ____No

Which level do you teach?

___ Elementary
___ Junior High
___ Senior High
___ Other_____
(Specify)

How many years have you taught?

___ 1-5 years
___ 5-10 years
___ 10 plus

What is the highest degree you hold?

___ Bachelor's
___ Master's
___ Specialist's
___ Doctorate

When was your last degree awarded?

___ 15 years ago
___ 5-10 years ago
___ 10 plus

General Courses

Please list all mathematics courses you have taken.

Undergraduate	Graduate

Professional Experience

	Yes	No
Inservice Math classes	___	___
Mathematics workshops	___	___
Professional Organizations in Mathematics	___	___
Inservice for district teachers on Scope & Sequence	___	___

Other (Specify) _____

REPORT OF THE KANSAS CITY COORDINATING CONFERENCE (KC3)

Some Concerns of Mathematics Educators about the Process of Developing State Plans for Basic Skills

1. Mathematics, instead of just computation, should be stressed throughout the plan. All ten basic mathematical skill areas listed in the National Council of Supervisors Position Paper on Basic Mathematical Skills should be emphasized.

2. The planning process should provide for sufficient opportunity for input by teachers of mathematics. The process should explicitly call for the involvement of mathematics specialists (particularly local supervisors and state supervisors as well as teachers and college mathematics educators) in a significant way at every stage of the planning and implementation.

3. The involvement of state and local professional mathematics education organizations affiliated with the National Council of Teachers of Mathematics should be explicitly called for throughout the planning process.

4. Concern for student competency in basic skills comes from the public. Professional expertise in basic skills instruction must come from specialists in mathematics, reading and writing. Therefore, the planning process must involve representatives from both the community and the professional specialists.

5. All states must have specialists in mathematics at the state level. In addition, all teachers and school districts should have the services of mathematics specialists more directly available to them.

6. Local involvement should come early in the state planning process to insure sufficient flexibility to allow for adaptability to various local situations.

7. Differences among urban, rural and suburban settings should be sufficiently considered in the planning. In particular, there is a great difference between situations where there is an existing curriculum support structure and situations where there is none.

8. The basic skills program should build on existing support structures rather than establishing competing ones.

9. In the immediate future, mathematics will need special extra attention in the state basic skills plans because the states are moving from a reading emphasis to a basic skills emphasis which involves mathematics.

10. The plan should contain a section which focuses on teaching and learning. This section should emphasize how the planning and public relations can serve the improvement of the learning of basic skills.

11. Procedures for assessing the mathematical needs of a population should be developed and refined.

12. In situations where former state or local right-to-read directors become basic skills coordinators, special precautions will be necessary to insure that mathematics instruction receives the proper attention.

13. The basic skills plan should provide for the coordination of basic skills instruction in various programs such as Title I, special education, community education, bilingual education and the locally funded programs. Conflicting or competing programs must be avoided.

14. Caution must be taken to insure that the emphasis on basic skills instruction does not limit opportunities for student learning in mathematics, language and the rest of the curriculum.

15. The basic skills program must be designed to bring about improved instruction in basic skills in the classrooms. It must avoid infusing another layer of bureaucracy with a possible counter-productive result.

16. Care must be taken to avoid placing an extra management burden on teachers. If the teachers are expected to do more testing and record keeping in addition to everything they are doing now, then they will have less time for instruction.

17. There must be sufficient recognition of the differences as well as the similarities in the learning of mathematics and the learning of language. For example, techniques that are successful for teaching reading do not automatically transfer to the teaching of mathematics.

18. The plan must provide a means of establishing priorities. For example, in the short range it may be necessary to concentrate efforts on immediate remediation in grades seven through twelve, but in the long run the greatest payoff may come from concentration in grades four through eight.

19. There is a need for criteria to determine whether or not a program should receive funding for instruction in basic skills. Programs that are only marginally involved in basic skills should not receive funds targeted for basic skills instruction.

Issues and Problems in the Teaching and Learning of Basic Mathematical Skills

Issues and problems in the teaching and learning of basic mathematical skills can be considered in three categories relating to students, to teachers and to institutions. We shall consider these three categories in the order of their importance, beginning with students.

Issues and Problems Concerning Students

Mathematics concept development in children should proceed from physical model to representational to abstract. Development of basic skill foundations must take this into consideration. Mathematics language development is a gradual process involving describing and recording as one goes through the various stages.

We need to amass and utilize existing information about how students can most effectively learn basic mathematics skills.

We need to develop and utilize effective means of involving parents in the process of helping their children to learn mathematics. These programs can also be designed to help parents learn mathematics.

We need to emphasize the relationship of language and mathematics. Mathematics should not consist only of numbers. The use of language in learning mathematics is critical. Furthermore, students must learn to apply mathematics to the real world and that involves interrelating language and mathematics.

We need to concern ourselves with the affective aspects of mathematics. How can we help students overcome mathematics anxiety? How can we help students to want to learn mathematics? How can we help to increase the numbers of females, of minorities, and of students from poverty backgrounds who go on to study more advanced mathematics in high school and in college? Mathematics is a critical filter which determines the range of career and higher education opportunities available to a student.

We need to provide for individual differences. We must not have different expectations for different students because of sex, race, socio-economic status or other external factors. However, we must recognize that all students do not start at the same place, nor do they have the same external support.

Mobility of students, particularly urban students, can cause problems. These problems are more severe where the programs in the schools are dramatically different and where the needs of incoming students are not adequately determined.

Problems associated with the mainstreaming of special education students into regular classes must be addressed. Both the special students and the regular students must receive appropriate instruction in basic mathematical skills.

Basic skill development must relate concept development, skill building and problem solving. Student learning will be negatively affected if there is a failure to maintain a balance between these three components.

Issues and Problems Concerning Teachers

Of all the factors related to successful instruction, the teacher is key. In order for a program of instruction to be successful, it must have teacher support. Therefore, it is essential that teachers be involved in program planning and development. Moreover, many of the best ideas for instruction come from creative teachers.

Teachers must be knowledgeable of the programs being taught and they must be able to relate to the students being taught. Therefore, the teachers must be provided with appropriate preservice and inservice training experiences.

There is a need for various inservice strategies for various segments of the teaching population. For example, many elementary teachers need to improve their knowledge of mathematics and how children learn mathematics. Many also need to overcome anxieties related to mathematics.

Secondary teachers usually have strong mathematics backgrounds, but they may lack skills necessary to teach basic mathematical skills to students who have not previously mastered them. With the widespread implementation of minimal competency programs, there is an urgent need to address this critical problem.

Appropriate levels and modes of staffing for effective instruction in basic skills is an issue of vital concern. We need to seek out the most cost effective organizational and staffing patterns for various subjects and various student populations. Furthermore, we must find means to insure that financial resources are made available to guarantee appropriate staffing for instruction of students with special needs in basic skills.

Teaching must not suffer because of the need for teachers to perform administrative management tasks. The use of teacher aides and of technology to lighten this burden should be explored.

Issues and Problems Concerning Institutions

There are critical curriculum research and development needs in mathematics in the area of basic skills, particularly at the secondary level. Currently, the schools are under pressure to produce competent high school graduates. To date, federal resources for basic skills have been concentrated at the elementary level--mostly in reading.

There is a need for a national clearinghouse to facilitate an exchange of information about local and state mathematics basic skills programs. We cannot afford to have everyone going out reinventing the wheel or making the same mistakes that have been made by others.

There is a need for a unified effort by all segments of the education population. This can probably be brought about internally better than externally. The key to this will be to devise strategies that convince each group that their concerns will be addressed from a stronger vantage point by combined effort. Curriculum support personnel at the state and local levels need to see themselves in a mutually reinforcing role.

The support of building and district line administrators is essential for effective instruction in basic skills.

Schools are presently in a bind between declining financial resources on the one hand and rising expectations for accountability on the other hand. At this time, there is a critical need to implement cost-effective programs of instruction in basic skills.

We need a systematic approach to skill development that does the following:

1. Identifies goals and objectives.

2. Develops an evaluation strategy (including testing) that measures student achievement of these objectives.

3. Develops and implements an instructional program.

4. Makes changes in the program and in individual instruction as indicated necessary by the evaluation system.

Existing commercially developed norm-referenced tests are not appropriate for these processes.

Some factors of concern about mathematics testing include:

1. Potential cultural and sex bias.
2. Issues of locus of control of testing (local, state, national).
3. The issue of secrecy that surrounds standardized testing (Are students being kept in the dark about what they are supposed to know?).
4. Potential curriculum stagnation as a result of testing.

There should be support for mathematics programs in local communities that will serve as an extension of mathematics programs in regular schools. For example, prototypes of facilities and programs that are available through private and non-educational institutions that support reading instruction should be encouraged.

Conclusion

We belive that the concerns and ideas that we have stated here will prove useful as the Department of Education proceeds to incorporate mathematics into its basic skills program. The opportunity for representatives from the National Council of Teachers of Mathematics, the National Council of Supervisors of Mathematics and the Association of State Supervisors of Mathematics to gather and provide this input makes us optimistic for the future of the national basic skills effort and the role that mathematics will play in that effort.

We have begun to establish effective communication between the mathematics education profession and the basic skills component of the Department of Education. We shall explore how this communication can be facilitated by the officers, the committees, the publications, the meetings and the affiliated groups of the National Council of Teachers of Mathematics, the National Council of Supervisors of Mathematics and the Association of State Supervisors of Mathematics. We feel that the communication process will be greatly facilitated when the Department of Education hires specialists in mathematics education to work in its basic skills effort.

Respectfully submitted,

Ross Taylor, KC3 Recorder

RT:ll
October 16, 1978

NATIONAL COUNCIL OF SUPERVISORS OF MATHEMATICS
POSITION PAPER ON
BASIC MATHEMATICAL SKILLS

INTRODUCTION

The currently popular slogan "Back to the Basics" has become a rallying cry of many who perceive a need for certain changes in education. The result is a trend that has gained considerable momentum and has initiated demands for programs and evaluations which emphasize narrowly defined skills.

Mathematics educators find themselves under considerable pressure from boards of education, legislatures, and citizens' groups who are demanding instructional programs which will guarantee acquisition of computational skills. Leaders in mathematics education have expressed a need for clarifying what are the basic skills needed by students who hope to participate successfully in adult society.

The narrow definition of basic skills which equates mathematical competence with computational ability has evolved as a result of several forces:

1. Declining scores on standardized achievement tests and college entrace examinations;
2. Reactions to the results of the National Assessment of Educational Progress;
3. Rising costs of education and increasing demands for accountability;
4. Shifting emphasis in mathematics education from curriculum content to instructional methods and alternatives;
5. Increased awareness of the need to provide remedial and compensatory programs;
6. The widespread publicity given to each of the above by the media.

This widespread publicity, in particular, has generated a call for action from governmental agencies, educational organizations, and community groups. In responding to these calls, the National Institute of Education adopted the area of basic skills as a major priority. This resulted in a Conference on Basic Mathematical Skills and Learning, held in Euclid, Ohio, in October, 1975.

The National Council of Supervisors of Mathematics (NCSM), during the 1976 Annual Meeting in Atlanta, Georgia, met in a special session to discuss the Euclid Conference Report. More than 100 members participating in that session expressed the need for a unified position on basic mathematical skills which would enable them to provide more effective leadership within their respective school systems, to give adequate

rationale and direction in their tasks of implementing basic mathematics programs, and to appropriately expand the definition of basic skills. Hence, by an overwhelming majority, they mandated the NCSM to establish a task force to formulate a position on basic mathematical skills. This statement is the result of that effort.

RATIONALE FOR THE EXPANDED DEFINITION

There are many reasons why basic skills must include more than computation. The present technological society requires daily use of such skills as estimating, problem solving, interpreting data, organizing data, measuring, predicting, and applying mathematics to everyday situations. The changing needs of society, the explosion of the amount of quantitative data, and the availability of computers and calculators demand a redefining of the priorities for basic mathematics skills. In recognition of the inadequacy of computation alone, NCSM is going on record as providing both a general list of basic mathematical skills and a clarification of the need for such an expanded definition of basic skills.

Any list of basic skills must include computation. However, the role of computational skills in mathematics must be seen in the light of the contributions they make to one's ability to participate in mainstream society. Combined effectively with the other skill areas, they provide the learner with the basic mathematical ability needed by adults.

DEFINING BASIC SKILLS

The NCSM views basic mathematical skills as falling under ten vital areas. The ten skill areas are interrelated and many overlap with each other and with other disciplines. All are basic to pupils' development of the ability to reason effectively in varied situations.

This expanded list is presented with the conviction that mathematics education must not emphasize computational skills to the neglect of other critical areas of mathematics. The ten components of basic mathematical skills are listed below, but the order of their listing should not be interpreted as indicating either a priority of importance or a sequence for teaching and learning.

Furthermore, as society changes, our ideas about which skills are basic also change. For example, today our students should learn to measure in both the customary and metric systems, but in the future the significance of the customary system will be mostly historical. There will also be increasing emphasis on when and how to use hand-held calculators and other electronic devides in mathematics.

TEN BASIC SKILL AREAS

Problem Solving

Learning to solve problems is the principal reason for studying mathematics. Problem solving is the process of applying previously acquired knowledge to new and unfamiliar situations. Solving word problems in texts is one form of problem solving, but students also should be faced with non-textbook problems. Problem-solving strategies involve posing

questions, analyzing situations, translating results, illustrating results, drawing diagrams, and using trial and error. In solving problems, students need to be able to apply the rules of logic necessary to arrive at valid conclusions. They must be able to determine which facts are relevant. They should be unfearful of arriving at tentative conclusions and they must be willing to subject these conclusions to scrutiny.

Applying Mathematics to Everyday Situations

The use of mathematics is interrelated with all computation activities. Students should be encouraged to take everyday situations, translate them into mathematical expressions, solve the mathematics, and interpret the results in light of the initial situation.

Alertness to the Reasonableness of Results

Due to arithmetic errors or other mistakes, results of mathematical work are sometimes wrong. Students should learn to inspect all results and to check for reasonableness in terms of the original problem. With the increase in the use of calculating devices in society, this skill is essential.

Estimation and Approximation

Students should be able to carry out rapid approximate calculations by first rounding off numbers. They should acquire some simple techniques for estimating quantity, length, distance, weight, etc. It is also necessary to decide when a particular result is precise enough for the purpose at hand.

Appropriate Computational Skills

Students should gain facility with addition, subtraction, multiplication, and division with whole numbers and decimals. Today it must be recognized that long, complicated computations will usually be done with a calculator. Knowledge of single-digit number facts is essential and mental arithmetic is a valuable skill. Moreover, there are everyday situations which demand recognition of, and simple computation with, common fractions.

Because consumers continually deal with many situations that involve percentage, the ability to recognize and use percents should be developed and maintained.

Geometry

Students should learn the geometric concepts they will need to function effectively in the 3-dimensional world. They should have knowledge of concepts such as point, line, plane, parallel, and perpendicular. They should know basic properties of simple geometric figures, particularly those properties which relate to measurement and problem-solving skills. They also must be able to recognize similarities and differences among objects.

Measurement

As a minimum skill, students should be able to measure distance, weight, time, capacity, and temperature. Measurement of angles and calculations of simple areas and volumes are also essential. Students should be able to perform measurement in both metric and customary systems using the appropriate tools.

Reading, Interpreting, and Constructing Tables, Charts, and Graphs

Students should know how to read and draw conclusions from simple tables, maps, charts, and graphs. They should be able to condense numerical information into more manageable or meaningful terms by setting up simple tables, charts, and graphs.

Using Mathematics to Predict

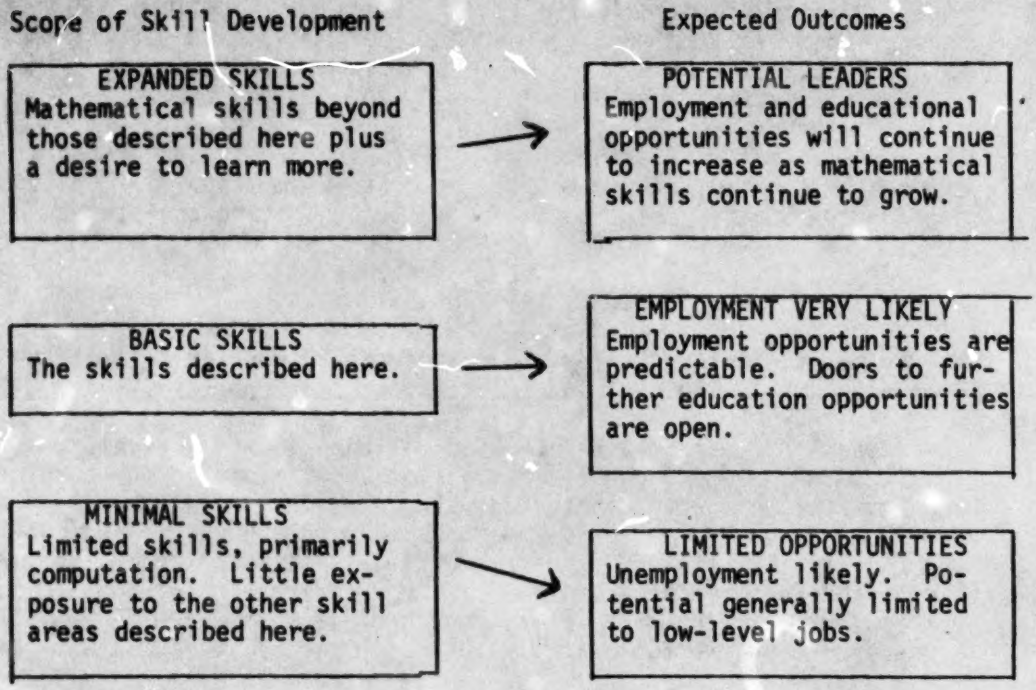
Students should learn how elementary notions of probability are used to determine the likelihood of future events. They should learn to identify situations where immediate past experience does not affect the likelihood of future events. They should become familiar with how mathematics is used to help make predictions such as election forecasts.

Computer Literacy

It is important for all citizens to understand what computers can and cannot do. Students should be aware of the many uses of computers in society, such as their use in teaching/learning, financial transactions, and information storage and retrieval. The "mystique" surrounding computers is disturbing and can put persons with no understanding of computers at a disadvantage. The increasing use of computers by government, industry, and business demands an awareness of computer uses and limitations.

BASIC SKILLS AND THE STUDENTS'S FUTURE

Anyone adopting a definition of basic skills should consider the "door-opening/door-closing" implications of the list. The following diagram illustrates expected outcomes associated with various amounts of skill development.


Scope of Skill Development
Expected Outcomes
EXPANDED SKILLS
Mathematical skills beyond those described here plus a desire to learn more.
POTENTIAL LEADERS
Employment and educational opportunities will continue to increase as mathematical skills continue to grow.
BASIC SKILLS
The skills described here.
EMPLOYMENT VERY LIKELY
Employment opportunities are predictable. Doors to further education opportunities are open.
MINIMAL SKILLS
Limited skills, primarily computation. Little exposure to the other skill areas described here.
LIMITED OPPORTUNITIES
Unemployment likely. Potential generally limited to low-level jobs.

MINIMUM ESSENTIALS FOR HIGH SCHOOL GRADUATION

Today some school boards and state legislatures are starting to mandate mastery of minimum essential skills in reading and mathematics as a requirement for high school graduation. In the process, they should consider the potential pitfalls of doing this without an appropriate definition of "basic skills." If the mathematics requirements are set inordinately high, then a significant number of students may not be able to graduate. On the other hand, if the mathematics requirements are set too low and mathematical skills are too narrowly defined, the result could be a sterile mathematics program concentrating exclusively on learning of low-level mathematical skills. This position paper neither recommends nor condemns minimal compentencies for high school graduation. However, the ten components of basic skills stated here can serve as guidelines for state and local school systems that are considering the establishment of minimum essential graduation requirements.

DEVELOPING THE BASIC SKILLS

One individual difference among students is style or way of learning. In offering opportunities to learn the basic skills, options must be provided to meet these varying learning styles. The present "back-to-basics" movement may lead to an emphasis on drill and practice as a way to learn.

Certainly drill and practice is a viable option, but it is only one of many possible ways to bring about learning and to create interest and motivation in students. Learning centers, contracts, tutorial sessions, individual and small-group projects, games, simulations and community-based activities are some of the other options that can provide the

opportunity to learn basic skills. Furthermore, to help students fully understand basic mathematical concepts, teachers should utilize the full range of activities and materials available, including objects the students can actually handle.

The learning of basic mathematical skills is a continuing process which extends through all of the years a student is in school. In particular, a tendency to emphasize computation while neglecting the other nine skill areas at the elementary level must be avoided.

EVALUATING AND REPORTING STUDENT PROGRESS

Any systematic attempt to develop basic skills must necessarily be concerned with evaluating and reporting student progress.

In evaluation, test results are used to judge the effectiveness of the instructional process and to make needed adjustments in the curriculum and instruction for the individual student. In general, both educators and the public have accepted and emphasized an overuse of and overconfidence in the results of standardized tests. Standardized tests yield comparisons between students and can provide a rank ordering of individuals, schools, or districts. However, standardized tests have several limitations including the following:

a. Items are not necessarily generated to measure a specific objectives or instructional aim.

b. The tests measure only a sample of the content that makes up a program; certain outcomes are not measured at all.

Because they do not supply sufficient information about how much mathematics a student knows, standardized tests are not the best instruments available for reporting individual pupil growth. Other alternatives such as criterion tests or competency tests must be considered. In criterion tests, items are generated which measure the specific objectives of the program and which establish the student's level of mastery of these objectives. Competency tests are designed to determine if the individual has mastered the skills necessary for a certain purpose such as entry into the job market. There is also need for open-ended assessments such as observations, interviews, and manipulative tasks to assess skills which paper and pencil tests do not measure adequately.

Reports of pupil progress will surely be made. But, while standardized tests will probably continue to dominate the testing scene for several years, there is an urgent need to begin reporting pupil progress in other terms, such as criterion tests and competency measures. This will also demand an immediate and extensive program of inservice education to instruct the general public on the meaning and interpretation of such data and to enable teachers to use testing as a vital part of the instructional process.

Large scale testing, whether involving all students or a random sample, can result in interpretations which have great influence on curriculum revisions and development. Test results can indicate, for example, that

a particular mathematical topic is being taught at the wrong time in the student's development and that it might better be introduced later or earlier in the curriculum. Or, the results might indicate that students are confused about some topic as a result of inappropriate teaching procedures. In any case, test results should be carefully examined by educators with special skills in the area of curriculum development.

CONCLUSION

The present paper represents a preliminary attempt by the National Council of Supervisors of Mathematics to clarify and communicate its position on basic mathematical skills. The NCSM position establishes a framework within which decisions on program planning and implementation can be made. It also sets forth the underlying rationale for identifying and developing basic skills and for evaluating pupils' acquisition of these competencies. The NCSM position underscores the fundamental belief of the National Council of Supervisors of Mathematics that any effective program of basic mathematical skills must be directed not "back" but forward to the essential needs of adults in the present and future.

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